

### Remarks

Claims 1-9 and 12 are pending and rejected. Claims 10, 11, 13 and 14 are withdrawn from consideration as being directed to non-elected subject matter, although if the elected species is found to be free of the prior art, the Examiner will extend the search and consideration to other species. Claims 15-28 were cancelled in response to the previous Restriction Requirement.

### Rejections under 35 U.S.C. 102 (e)

Claims 1-3, 9, and 12 were rejected under 35 U.S.C. 102 (e) as anticipated by U.S. Patent No. 6,905,710 to Wani et al. (Wani).

Wani purportedly teaches a method for inhibiting osteoclast formation by administering a hydrosylate extract from Indian green mussel. The Examiner has stated that the hydrosylate extract inherently contained the L-aspartic-N-sulfonic acid required in the claimed methods, in part because the present application states that the sulfonic acid derivatives of acidic amino acids are contained in the extract disclosed by Wani.

The compounds of the present invention have the general formula  $ZOC-(CRR)_m-COOH$ , wherein  $m = 2, 3$  or  $4$ ;  $Z$  is  $OH$  or  $NH_2$ ; one  $R$  in the compound is from the group consisting of  $SO_3H$ ,  $OSO_3H$ ,  $CH_2-SO_3H$ ,  $CH_2-OSO_3H$  and  $NHSO_3H$ , and the remaining  $R$ s are  $H$  or  $NH_2$ , optionally with an additive, excipient, diluent or carrier.

In contrast, the composition in Wani comprises of  $10 \mu g/ml$  of mussel hydrolysate and at least one additive, wherein none of the compounds in the mussel hydrolysate are specifically defined by any chemical formula.

In the present invention, the inhibition of mononuclear and multinuclear TRAP-positive osteoclast formation is about 97.94 % (as evidenced by Table A on page 52 of the specification). In contrast, the inhibition achieved by Wani was only about 50%.

The inhibition of bone resorption is about 90% in the present invention. In contrast, the inhibition achieved by Wani was only about 70%.

With respect to Claim 4, the pharmaceutical effective amount of the compound is 5 to 10 mg/kg of body weight, whereas the concentration of the hydrolysate in Wani is 10µg/ml or above, which does not disclose or suggest the claimed concentration.

It is clearly evident from lines 31 of page 8 to line 1 of page 9 of the specification that the compound claimed in the present application is obtained by the purification of some active components from the extract and these active components significantly inhibit both osteoclast formation and bone resorbtion. Importantly, the compounds claimed in the present application are a series of novel sulfonic acid/ sulfate derivatives of acidic amino acids, aspartic acids, glutamic acids, homoglutamic acids and their related aliphatic dicarboxylic acids (succinic acids, glutaric acid and adipic acid), and these active compounds play a vital role in the inhibition of differentiation of osteoclasts from homopoietic precursors, and can be used in therapeutic settings to protect and cure the individuals against osteoporosis and other metabolic bone diseases.

The examples shown on pages 49 to 53 of the specification relate to the preparation and efficacy of these (isolated) active compounds. The compounds in the claims as amended are isolated compounds, whereas the impure hydrosylate is relatively ineffective at treating the disorders treated by the claimed compounds. Wani does not disclose pure compounds, or the structure of any individual compound present in the hydrolysate, let alone which compound and at which concentration would be effective at treating the disorders in the claimed compounds.

For at least these reasons, withdrawal of the rejection is respectfully requested.

#### **Rejections under 35 U.S.C. 103 (a)**

Claims 1-9 and 12 were rejected under 35 U.S.C. 103 (a) as obvious over Wani. This rejection is respectfully traversed if applied to the amended claims.

As discussed above, the amended claims relate to the use of specific isolated compounds in specific methods, whereas Wani relates to the use of a hydrolysate that does not isolate or characterize any individual compounds.

It would not have been obvious from Wani what compounds, at what concentrations, would be useful in the claimed methods. Accordingly, Applicants respectfully request that the rejection be withdrawn.

**Rejections under the Judicially Created Doctrine of  
Obviousness-Type Double Patenting**

Claims 1-9 and 12 were rejected under the judicially created doctrine of obviousness-type double patenting, as being unpatentably obvious over claims 1-24 of Wani. For the reasons stated above with respect to the obviousness rejection of these claims under 35 U.S.C. 103 (a), Applicants respectfully assert that this rejection should be withdrawn.

**Conclusion**

It is believed that the claims as amended are currently in condition for allowance, and prompt notification of such is respectfully requested.

Respectfully submitted,

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